

Šumovit Greben, a tale of a rhyolitic lava dome

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Late Miocene to Pleistocene volcanism in the Vardar zone covers a large area, has a wide range in composition, and it is connected to the tectonic evolution of the Aegean extensional regime. The scattered potassic to ultrapotassic volcanism developed south from Scutari-Peć transverse zone ca. 8.0-1.5 Ma along deep structures [1, 2]. Besides these small-volume volcanic centers, a large contemporaneous SW-NE trending Kožuf-Voras volcanic system was formed comprising numerous lava domes and various pyroclastics.

Šumovit Greben is a rhyolitic lava dome, the westernmost member of the Kožuf-Voras volcanic system. Based on field observations, several units can be differentiated that represent solely the different lithofacies (i.e. basal breccia, coherent glass, foliated rhyolite and microcrystalline rhyolite) of a slowly cooling rhyolitic lava dome. Remnants of feeder dyke mark the potential conduit for the upwelling magmas. The main volume of the lava dome formed at 2.9 ± 0.1 Ma based on the unspiked Cassagnol-Gillot K-Ar ages on groundmass. A small-volume lava flow on the northern part of Šumovit Greben defines the end of its activity at 2.78 ± 0.08 Ma. Although its eruption age is slightly overlapping with the underlying unit, it exhibits mineralogical (e.g. presence of plagioclase-clinopyroxene aggregates) and geochemical differences (e.g. lower SiO₂ content, lower ⁸⁷Sr/⁸⁶Sr, higher ¹⁴³Nd/¹⁴⁴Nd ratios) marking it as a distinct lava flow.

The rare earth element content of the studied samples from Šumovit Greben displays similarities to cold-wet-oxidized rhyolites characteristics for subduction zone rhyolites. The negative Ba, Sr, Ti and Eu anomalies, together with the extremely low MgO content of the studied samples suggest fractionation of plagioclase and pyroxene at depth. The younger lava flow sampled more extensively this deeper part of the magma storage system represented by the abundant aggregates of clinopyroxene ± plagioclase ± biotite.

[1]Yanev et al. (2008) Min Pet 94(1-2), 45-60. [2]Molnár et al. (2021) Int J Earth Sci.

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